05I1G–01

SYSTEM DESCRIPTION

1. GENERAL

- When the front and rear door system detects that the front and rear doors are ajar, it automatically actuates the motor to fully close the front and rear doors.
- Position detection switches are provided in the door closer mechanism in each of the front and rear doors' lock assemblies to detect whether the front and rear doors are open, closed or ajar. If a detection signal that indicates that a front or rear door is ajar is transmitted to the door ECU, the door ECU actuates the door closer motor to fully close the door.
- In this system, each door is independently controlled by the door ECU inside each door. The door ECUs, which communicate via the BEAN, belong to the door bus.
- A mechanical cancel mechanism is provided. This mechanism enables the front and rear doors to be opened by operating either the outside or inside door handle while the door closer system is operating. Through the function of the link and the lever that move together with the movement of the door handle, the mechanical cancel mechanism cuts off the transmission of power from the motor and disables the operation of the door closer system, thus enabling the door to be opened.
- If the operation of the door close system is not completed within approximately 3 seconds (a foreign object is jammed in window, for example), the door ECU will interpret it as a malfunction and stop applying the current to the motor.

2. FUNCTION OF COMPONENT

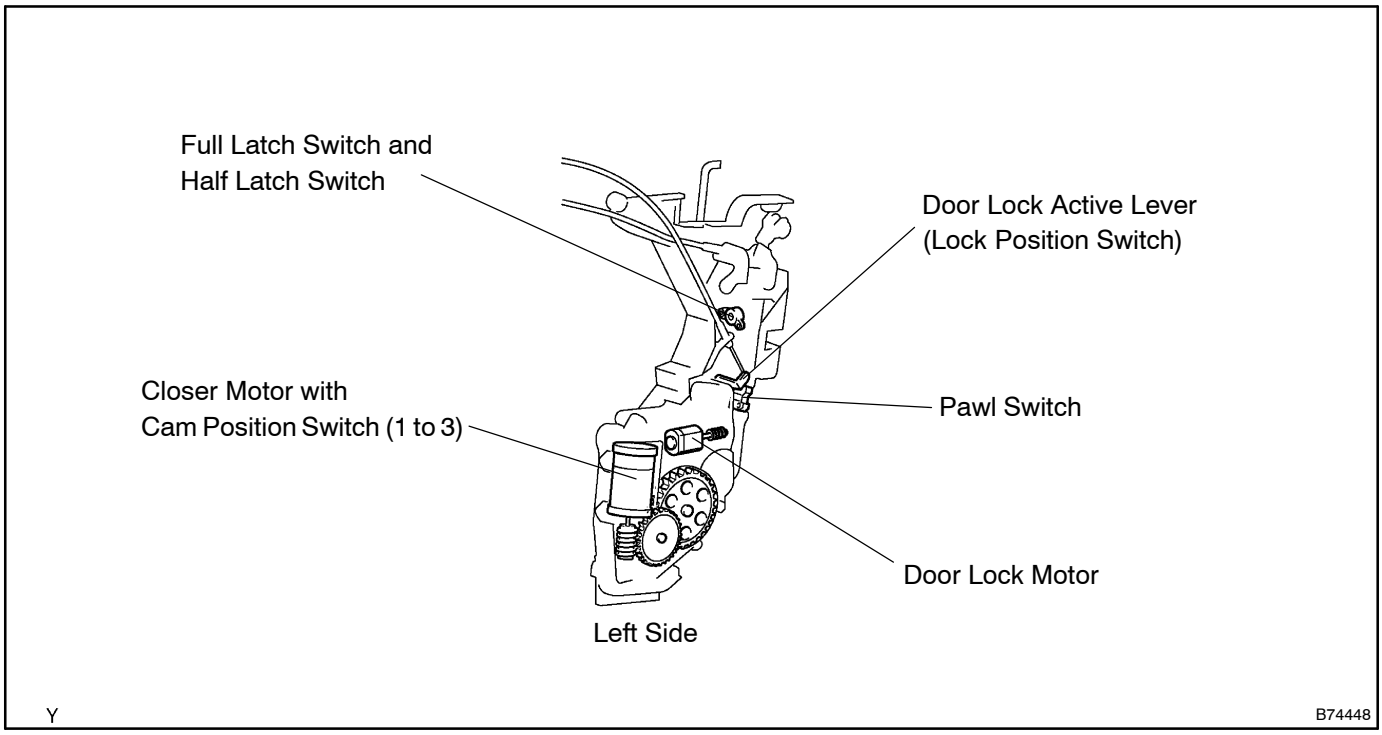
The close system consists mainly of a door closer assembly and the door ECU. Each door closer assembly contains a switch and a motor. The components' functions are listed in the table below.

Components	Function
Door Closer Assembly	Door closer assembly consists of door lock mechanism and closer mechanism. Door lock mechanism performs operation of normal door lock. Closer mechanism transmits rotational movement of door closer motor via lever and latch to fully close front and rear doors that are ajar.
Pawl Switch	Changes in engagement of striker pole with latch are detected by ON or OFF signal of switch, which is then transmitted to door ECU.
• ● Full Latch Switch • ● Half Latch Switch	Whether latch is fully latched or half latched is detected in accordance with rotating position of latch, and signal is transmitted to door ECU.
• ● Cam Position Switch 1 • ● Cam Position Switch 2 • ● Cam Position Switch 3	Rotating position of closer motor is detected by ON/OFF pattern of three switches and appropriate signal is transmitted to door ECU.
lock Position Switch	Detects whether door is locked or unlocked and transmits signal to door ECU.
Closer Motor	Actuated by signals from door ECU, this motor rotates latch from half–latched to full–latched position.
Door Lock Motor	Actuated by signal from door ECU, this motor moves link to lock or unlock door.
Door ECU	Controls closer system in accordance with signals from switches that are provided in door closer assembly.

3. CONSTRUCTION AND OPERATION

Door Closer Assembly

- The door closer assembly consists of a door lock mechanism that performs the ordinary door lock control, and a closer mechanism that performs door closer control. In addition, the assembly contains a pawl switch, full latch switch, half latch switch, closer motor and door lock motor.
- The cam position switches (1 to 3) that detect the rotating position of the closer motor are provided in the closer motor. The lock position switch is integrated with the base of the door lock active lever.



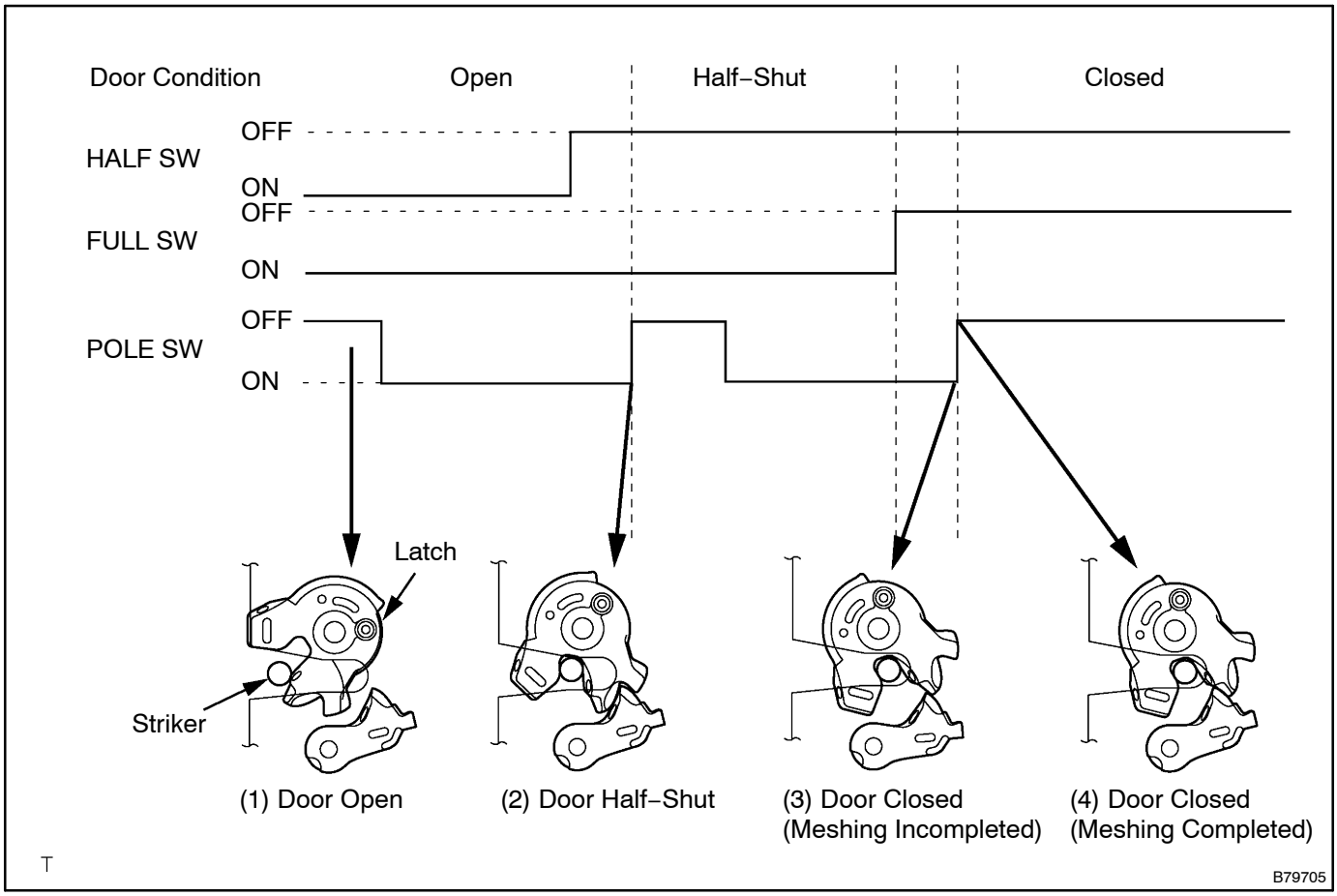
Door ECU

(a) General

- In the door closer system, the door ECU detects the transition of the door from the open state. The ECU then actuates the closer motor to rotate the latch to fully close the door. This ECU is provided in each of the doors and independently controls the respective door. These ECUs, which maintain communication via the BEAN, belong to the door bus.
- When the system is activated, if the door ECU detects an abnormal condition, the door ECU outputs applicable DTCs (Diagnostic Trouble Codes). DTCs can be accessed through the use of a intelligent tester II.

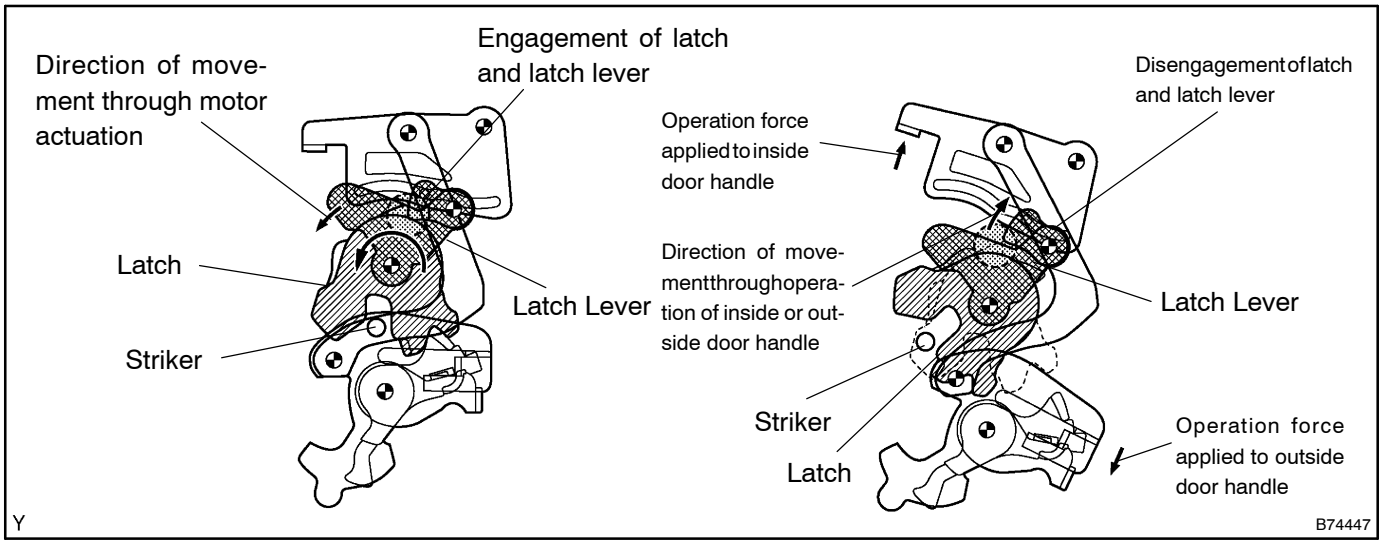
(b) Operation

The timing chart below shows the basic operation of the door closer system.



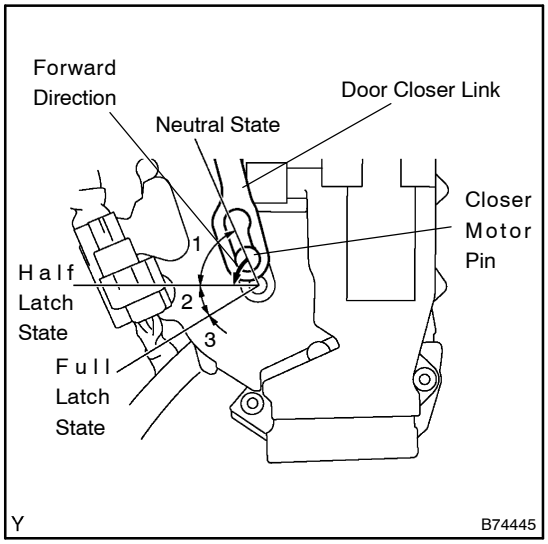
(c) Cancel Function

- In the door closer system, operating the inside or outside door handle cuts the link between the latch and the closer motor. This cancels the system and allows the door to be opened regardless of the state of the system.
- For example, if the system is operating from the half latched state to the fully latched state, the actuation force of the motor causes the latch lever to push and turn the latch so that the striker can be pulled in by the latch.
- While the closer system is activated, operating the inside or outside door handle disengages the latch lever and latch. This releases the latch, allowing the door to open.

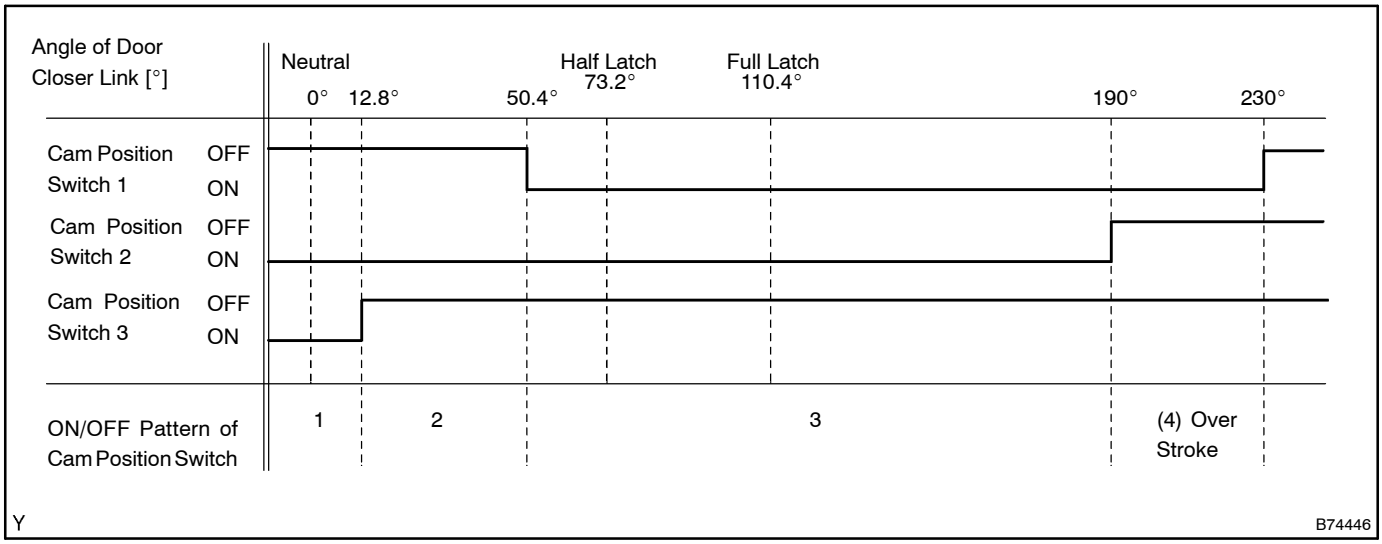


HINT:
If the child lock of a rear door is engaged, it cannot be canceled by operating the inside door handle.

(d) Closer Motor and Cam Position Switch



Three cam position switches (1 to 3) are provided in the closer motor. In accordance with these switches' ON/OFF patterns, the closer motor's rotating positions are determined in the 3 segments of the motor's moving range.



When rotation operation is normal, the operation starts from the top of the list. During reverse rotation, operation starts from the bottom of the list.

Closer motor condition	CPS1	CPS2	CPS3
(Error range)	OFF	OFF	OFF
Cam position switch pattern 1	OFF	ON	ON
Cam position switch pattern 2	OFF	ON	OFF
Cam position switch pattern 3	ON	ON	OFF
Cam position switch pattern (4)	ON	OFF	ON
(Error range)	OFF	OFF	OFF

(e) Fail–safe

The door ECU stops the door closer system if it detects a malfunction in the system. However, the doors can be opened or closed manually.